



QUICK GUIDE

# WHEN TO AUTOMATE LIQUID HANDLING IN YOUR LAB

# ARE YOU CONSIDERING AUTOMATING YOUR LAB?

Many companies are tempted to utilize the new laboratory technologies but have some trepidation about incorporating robots into an already established laboratory setup.

We get it. It can seem like a lot of work. But it can also be quite simple. After all, many robots are carefully designed to be extremely user-friendly and flexible. And in the end, you can save yourself from tons of manual work, and use your time better, with the push of a few buttons.

But when should you let the robot do the heavy lifting in your liquid handling process and what is the right fit for your laboratory? Turn the page to find out.



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Read what to consider before  
automating your lab

# THE CHALLENGES OF MANUAL PIPETTING

Manual pipetting is the standard under which many laboratory technicians work. Unfortunately, working in a fixed position and doing the same arm movement throughout the day can cause serious work-related strain injuries.

In addition, manual pipetting enhances the risk of human errors and contamination – especially when going from one step to the next in a workflow.

Another challenge of manual pipetting is that it is tedious and puts heavy pressure on laboratory staff. They might spend hours doing repetitive work where they could otherwise do more valuable work, such as research or analysis, to increase throughput.

The American Society for Clinical Pathology conducted a survey of laboratory professionals in 2020 and

reported that 85.3% felt burnt out and 36.5% reported inadequate staffing. These are all some of the pains that an automation solution can relieve you of.



Many of my former students, now colleagues in medical laboratories all over the country, are exhausted and dealing with burnout or thoughts of quitting.

Rodney E. Rohde, Professor of Clinical Laboratory Science, Texas State University



# IS AUTOMATION A GOOD SOLUTION FOR ME?

Not every laboratory needs automation, so we always suggest that you take a moment to consider what your specific requirements are before making the investment.

We generally recommend using an automation solution if you have a workflow with one or more steps of repetitive and time-consuming liquid handling per week.

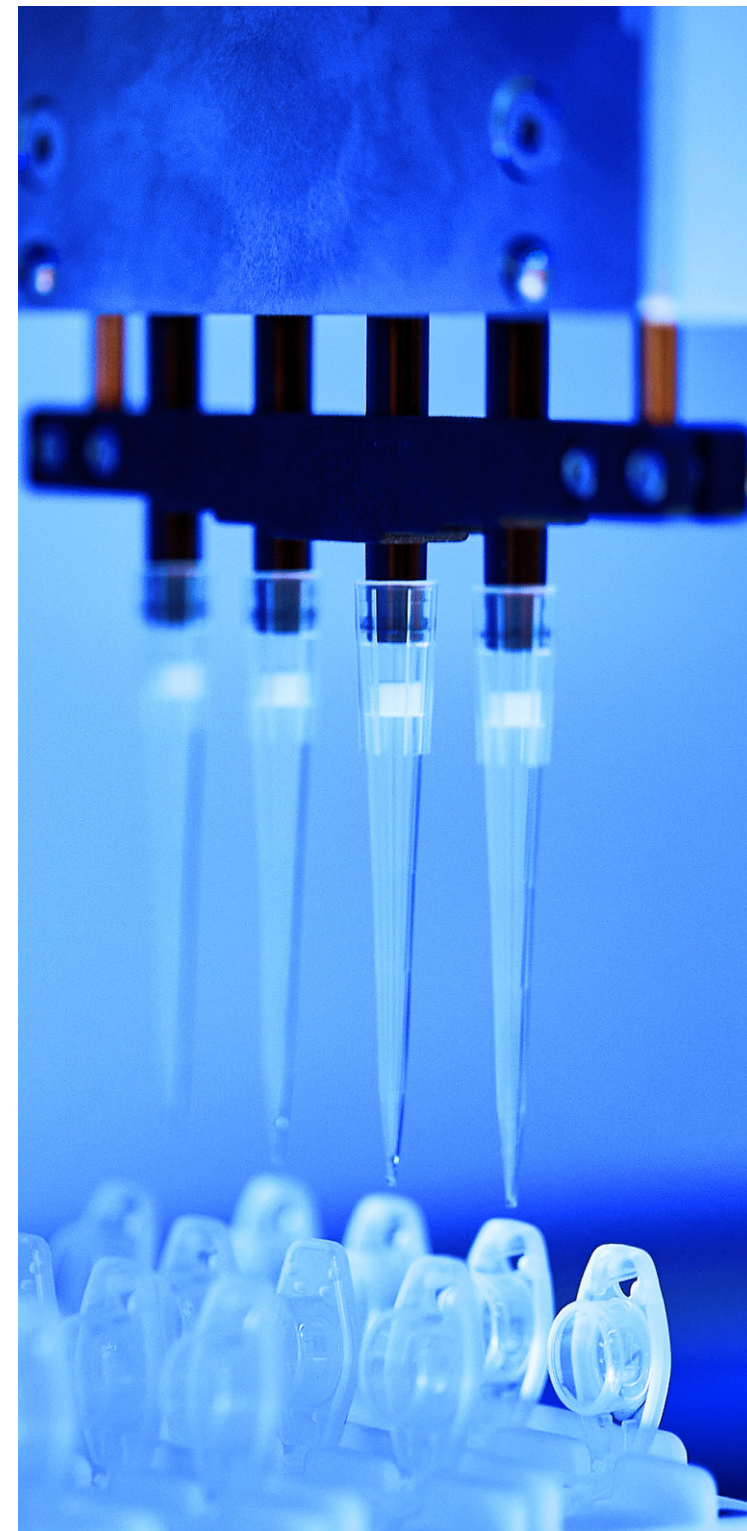
Liquid handling robots can play a role in a wide range of pipetting applications and tasks in your laboratory. Some applications that can easily benefit from automated pipetting are:

- ✓ PCR and qPCR
- ✓ Next Generation Sequencing
- ✓ Normalization
- ✓ Dilution (serial, plate-to-plate etc.)
- ✓ Reformatting, cherry picking, transferring
- ✓ Sample aliquoting
- ✓ ELISA sample preparation
- ✓ Microplate filing

If your laboratory works with any of them on a regular basis, automation might be a perfect fit for you.

Today, there are automation systems for nearly every laboratory. Some laboratories have a huge throughput and some work on a much smaller scale. If you have a very large throughput, a large automation workstation might make sense.

If, on the other hand, you are doing around 3-4 plates at a time, you should go for a smaller and more flexible robot such as a plug and play pipetting solution.





# 5 BENEFITS OF AUTOMATION

Robots are an irreversible part of the future and there is a good reason for that: they can make many aspects of our lives more convenient and significantly easier. Let us take you through some of the ways in which they can optimize your laboratory and the overall well-being of your staff:

## 1 Increased throughput

An automated solution will allow your setup to give the ultimate performance and thereby increase your throughput.

## 2 Fewer work-related injuries

Fewer fixed working positions and repetitive arm movements mean fewer strain injuries and better health and well-being of the staff. In that sense, robots are all about people.

## 3 More time for laboratory staff to do other valuable work

Your staff will be able to focus on other valuable tasks and thereby improve the productivity of your laboratory in general.

## 4 Greater accuracy from one liquid handling step to the next

An automated solution can provide a high level of accuracy. Many modern solutions will also keep track of the steps and allow you to export relevant data.

## 5 Fewer human errors

Nobody is perfect and manual work always comes with a risk of human errors no matter how talented the staff is.

But robots do the work they are programmed for flawlessly and allows the staff to use their talents on other tasks and utilize their full potential.

# THE DOWNSIDE TO AUTOMATED LIQUID HANDLING

There are upsides and downsides to everything, including automation, and it is always a good idea to weigh the good against the bad. Does any of these points resonate with your laboratory setup?

- ✓ Skill loss: When all you must do is press a button, you risk losing the understanding or mastery of how to do the task yourself. However, you gain new skills related to the laboratories of the future.
- ✓ Inflexibility: Some systems can be used only for one task and/or require you to use only a particular type of labware. In those cases, you might gain more flexibility from handheld pipetting.
- ✓ Expensive investment: An automation solution can be an expensive investment and there is a huge price range on the market. But depending on your lab setup, you can save money long term when you factor in the increased productivity in your laboratory
- ✓ Difficulty: Some automated systems are difficult to install, learn how to program and/or to run. In these cases, you might need to have a superuser or programmer in your staff.



# QUESTIONS TO ASK YOURSELF BEFORE YOU INVEST IN AUTOMATION

There are many different automation solutions on the market. Answering the following five questions, will guide you towards the right product.

## ? How much manual pipetting do I have in my workflow?

This will determine whether you need an automation solution to begin with. As a starting point, we recommend automation if you have a workflow with time-consuming manual pipetting at least once a week.

## ? Which external devices do I need?

It is a good idea to consider which external devices you need in your current or future workflow, and make sure to choose a system they can be integrated into.

Some robots are limited in that aspect while others can integrate devices such as coldplates, shakers, magnetic decks and cooling blocks.

## ? How much flexibility do I need?

If you have many different pipetting tasks and applications, you should go for a flexible solution where it is easy to switch between protocols.

## ? What is my budget?

Make sure you choose a solution that matches your budget – and watch out for hidden costs.

It is also a good idea to make sure that you can use SBS standard racks and that pipette tips are not limited to the vendor's brand as that can be more expensive over time without complex software so everybody can learn.

## ? Who will use the robot?

If you don't have technical staff or if there are many different users of the same robot, you should go for a version without complex software so everybody can learn.

Not all solutions are equally intuitive.

**ON NEXT  
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Get a checklist



## CHECKLIST

Use this list as a tool to choose your new robot:

- ✓ Map out your workflows
- ✓ Make an overview of your:
  - Throughput
  - Users
  - Need for flexibility
  - External devices
  - Budget
- ✓ Do thorough market research
- ✓ Read product reviews
- ✓ Reach out to learn more
- ✓ Book a demo

We are always available for a chat or a demo if you wish to know more about our solution, flowbot® ONE, and find out if it is the right fit for you.



# HOW NORDIC BIOSCIENCE WENT FROM MANUAL TO AUTOMATED PIPETTING

A need for reducing pipetting injuries and meeting future demand for growth got Nordic Bioscience started on automating some of their processes.

Kishwar Musa is heading the lab and explains:

“With an increasing growth in the Clinical Lab and an increased focus on optimizing the work processes to meet future demands, bringing automatized equipment was a natural next step for us. In addition, we also had a focus on reducing pipetting injuries among our technicians and with Flow Robotics we really saw a great opportunity to move forward.”

“We had visited other competitors with similar pipetting robots. Unfortunately, they had complex software that required skilled employees to code the pipetting programs. So, when we were introduced to a more user-friendly

software and robot at Flow Robotics, we were very excited. We envisioned our technicians being able to operate the device relatively easy.”

Helle Nielsen is a lab technician in Kiswars team and has also been part of the whole process. She says:

“the software is so easy to use, and it only took a few days before we were ready to start a validation of the robots.”

Kishwar Musa sums up what they have seen of results:

“We have saved time on the manual pipetting of samples onto the ELISA plates. flowbot® ONE allowed us to

increase the throughput from 4-5 plates tested per technician to 6-8 plates by simply introducing the automatic pipetting device to the workflow. We have also seen a significant decrease in pipetting injuries.”



# WANT TO TAKE NEXT STEP?



We have to admit that we're not 100% objective when it comes to automated flow handling solutions. But we are 100% committed to making liquid handling easier – and to being 100% honest about what our flowbot® ONE can and cannot do.

With flowbot® ONE, you get a flexible, super user-friendly liquid handling robot that is securely controlled using an Internet browser.

- ✓ No programming skills needed.
- ✓ Reasonable prices.
- ✓ Learn to use it in 1 hour.

Using patented technology, flowbot® ONE combines live video with an intuitive user interface.

Specifying protocols has never been easier.



**GET A FREE,  
NO-STRINGS-ATTACHED  
DEMO**